

**YOUNG AH SEO, Ph.D.**  
**CURRICULUM VITAE**  
September 2020

**PERSONAL DATA**

Title: Assistant Professor of Nutritional Biochemistry

Work address: University of Michigan School of Public Health  
Department of Nutritional Sciences  
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Ann Arbor, Michigan 48109-2029  
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**EDUCATION**

2014–16 Harvard School of Public Health  
Postdoctoral Research Associate  
Department of Genetics & Complex Diseases  
Mentor: Marianne Wessling-Resnick, Ph.D. (Deceased in 2019)

2012–14 Harvard School of Public Health  
Postdoctoral Research Fellow  
Department of Genetics & Complex Diseases  
Mentor: Marianne Wessling-Resnick, Ph.D. (Deceased in 2019)

2007–12 Pennsylvania State University  
Ph.D.  
Department of Nutritional Sciences  
Mentor: Shannon Kelleher, Ph.D.

2004 Ewha Womans University, Seoul, South Korea  
B.S. *Magna Cum Laude*  
Department of Food and Nutritional Sciences

**ACADEMIC APPOINTMENT**

2016–present Assistant Professor  
University of Michigan School of Public Health  
Department of Nutritional Sciences

**OTHER PROFESSIONAL POSITIONS**

2005–2007 Seoul National University College of Medicine  
Research Fellow  
Department of Microbiology & Immunology

2004–2005 Seoul National University  
Research Assistant  
Lab of Molecular Genetics  
Department of Biological Sciences

## HONORS AND AWARDS

- 2019 E. L. R. Stokstad Outstanding Young Investigator Award given for excellent fundamental research in nutrition  
The American Society for Nutrition
- 2019 MICHR “Pathway to Independence” Award  
Michigan Institute for Clinical & Health Research (MICHR), University of Michigan
- 2018 Inaugural Early-Career Faculty Investigator Grant Award  
Neurodegeneration of brain iron accumulation (NBIA) association
- 2016 Grand Prize of the Postdoctoral Research Award  
The American Society for Nutrition
- 2014 NIH/NIEHS K99/R00 “Pathway to Independence” Award
- 2012 Robert Gunn Student Award for Cell and Molecular Physiology  
The American Physiological Society
- 2012 Penn State Alumni Association Dissertation Award at the College level  
Pennsylvania State University
- 2011 Woot-Tsuen Wu Leung Scholarship given to outstanding nutrition students  
Pennsylvania State University
- 2011 Grand Prize of the Vitamin and Mineral Research Poster Competition  
The American Society for Nutrition
- 2010 Grand Prize of the Graduate Student Research Award Competition  
The American Society for Nutrition
- 2010 Wrigley Science Institute Predoctoral Fellowship for Students in Nutrition Research  
The American Society for Nutrition
- 2004 *Magna Cum Laude* graduate  
Ewha Womans University, Seoul, South Korea

## GRNAT SUPPORT

### CURRENT

R01 DK123022 (Seo)

08/01/2020 – 6/30/2025

NIH/NIDDK

*Manganese in Inflammatory Bowel Disease*

The goal of this proposal is to provide fundamental insights into the physiology of manganese homeostasis and the pathophysiology of IBD and establish the framework for implementation of precision medicine in the management of patients with IBD with an ultimate goal to reduce prevalence and national-health care burden of IBD.

Role: Principal Investigator

R01 HL140526 (Burke & Kim)

08/01/2018 – 05/31/2022

NIH/NHLBI

*Using a Small Molecule Iron Transporter to Understand and Treat FPN1 Deficiencies in Mice*

The goal of the overall research is to illuminate the role defective iron transport plays in both genetic and acquired FPN1 deficiencies, the fundamental similarities that underlies these diverse diseases, the putative compensatory role the endogenous homeostatic mechanisms play in these diseases, and the potential for the realization of a new approach to treat these diseases with a small molecule that mimics the function of a missing protein.

Role: Co-Investigator (30% effort)

- R21 NS112974 (Seo) 05/01/2020 – 10/31/2021  
NIH/NINDS  
*Exploring the Roles of Manganese in Neurons*  
The specific objective of this project is to establish a mouse model that we can use to explore the roles of manganese in neurons.  
Role: Principal Investigator
- N025945 (Seo) 09/01/2018 – 08/31/2021  
Neurodegeneration with Brain Iron Accumulation (NBIA) Disorders Association  
*Defining the Roles of Iron in BPAN*  
The aim of the proposed project is to understand the interplay between iron and autophagy in WDR45 deficiency and to identify the molecular lesion that causes iron overload in BPAN.  
Role: Principal Investigator
- P30 DK034933 (Owyang) 06/01/2019 – 05/31/2021  
University of Michigan Center for Gastrointestinal Research Pilot/NIH  
*Manganese in inflammatory bowel disease*  
This project will define the roles of an essential micronutrient manganese that regulate intestinal health, advancing research into the etiology of IBD while developing therapeutic targets for IBD.  
Role: Principal Investigator of Pilot Award
- U063996  
University of Michigan, MCUBED (Shah) 09/01/2018 – 12/31/2020  
*Role of Micronutrients in Intestinal Stem Cells*  
This project will define the requirements of iron and manganese in wound healing, characterize the role of these micronutrient in ISC response following intestinal injury, and understand if iron and manganese balance can be targeted for therapy in intestinal disorders.  
Role: Co-Investigator of Pilot Award
- P30 ES017885 (Dolinoy) 09/01/2010 – 03/31/2020  
University of Michigan, Michigan Center of Lifestage Environmental Exposures and Disease (M-LEEaD)/NIH  
*Exploring the roles of manganese on neurodevelopment*  
The goal of the proposed research is to provide the first link between neuronal Mn levels and neurodevelopment as well as providing mechanistic insights into Mn-related neurodevelopmental disorders.  
Role: Principal Investigator of Pilot Award
- PENDING
- R01 NS118204 (Seo)  
NIH/NINDS  
*Using a Small Molecule Iron Transporter to Understand and Treat Brain Iron Overload*  
This project aims to develop a “molecular prosthetics” approach for treating neurodegeneration with brain iron accumulation (NBIA) and age-related neurodegenerative disorders.  
Role: Principal Investigator
- R21 AI149069 (Chang)  
NIH/NIAID  
*Iron-Mediated Regulation of T Cell Immunity*  
The goal of this research is to investigate the impact of Fe homeostasis for CD4 T cell survival and proliferation and determine the role of Fe for the regulation of CD4 T cell metabolism.  
Role: Co-Investigator

COMPLETED

- R00 ES024340 (Seo) 07/01/2016 – 06/30/2019  
NIH/NIEHS  
*Influence of Genetic Variation on Manganese Neurotoxicity and Parkinson's Disease*  
The research goals are to investigate manganese-induced transport and neurotoxicity in the context of environmental exposure and pathogenesis of neurodegeneration.  
Role: Principal Investigator
- K99 ES024340 (Seo) 09/08/2014 – 06/31/2016  
NIH/NIEHS  
*Influence of Genetic Variation on Manganese Neurotoxicity and Parkinson's Disease*  
The research goals are to investigate manganese-induced transport and neurotoxicity in the context of environmental exposure and pathogenesis of neurodegeneration.  
Role: Principal Investigator
- 5UL1TR002240 (Mashour) 04/01/2019 – 03/31/2020  
University of Michigan, Michigan Institute for Clinical & Health Research (MICHR)/NIH  
*Reversing Brain Iron Overload by a Natural Small Molecule*  
The goal of the proposed research is to determine the effects of a natural small molecule on brain iron overload, cognitive function, and neurodegeneration using a leading mouse model of hereditary hemochromatosis.  
Role: Principal Investigator of Pilot Award
- P30 ES017885 (Loch-Caruso) 07/01/2018 – 03/31/2019  
University of Michigan, Michigan Center of Lifestage Environmental Exposures and Disease (M-LEEaD)/NIH  
*Toward discovering stabilizers of cellular manganese levels*  
The goal of the proposed research is to employ unbiased CRISPR/Cas9 genetic screens to uncover novel upstream machineries that maintain optimal cellular manganese levels in response to environmental manganese changes.  
Role: Principal Investigator of Pilot Award
- P30 ES000002 (Dockery) 08/13/2015 – 05/01/2016  
NIH/NIEHS  
Harvard University NIEHS Center for Environmental Health/NIH  
*Effect of Ferroportin Genetic Variants on Intracellular Metal Levels*  
The goal of this project is to determine the effects of known human ferroportin mutations on intracellular levels of multiple metals.  
Role: Principal Investigator of Pilot Award
- P30 ES000002 (Dockery) 02/09/2015 – 05/01/2015  
NIH/NIEHS  
Harvard University NIEHS Center for Environmental Health/NIH  
*Tissue Metal Analysis of Flatiron Mice*  
The goal of this project is to measure multiple metals in different mouse tissues in a genetic model of ferroportin deficiency and human ferroportin disease.  
Role: Principal Investigator of Pilot Award
- P30 ES000002 (Dockery) 03/01/2013 – 03/01/2015  
NIH/NIEHS  
Harvard University NIEHS Center for Environmental Health/NIH

*Manganese-induced Neuronal Cell Apoptosis through ER Stress*

The goals of this project are to investigate the mechanistic relationship between iron deficiency and manganese neurotoxicity.

Role: Principal Investigator of Pilot Award

## BIBLIOGRAPHY

### RESEARCH PUBLICATIONS IN PEER REVIEWED JOURNALS

21 totals including 10 as first author and 5 as corresponding author

\*First author; †Corresponding author

1. Genome-Wide Association Meta-Analysis of Individuals of European Ancestry Identifies Suggestive Loci for Sodium Intake, Potassium Intake, and Their Ratio Measured from 24-Hour or Half-Day Urine Samples. (2020) Kho M, Smith JA, Verweij N, Shang L, Ryan KA, Zhao W, Ware EB, Gansevoort RT, Irvin MR, Lee JE, Turner ST, Sung J, van der Harst P, Arnett DK, Baylin A, Park SK, **Seo YA**, Kelly KM, Chang YPC, Zhou X, Lieske JC, Kardina SLR. *Journal of Nutrition* Online ahead of print.
2. Bakulski KM\*, **Seo YA\***, Hickman RC, Brandt D, Vadari HS, Hu H, and Park SK. (2020) Heavy metals exposure and Alzheimer's disease and related dementias. *Journal of Alzheimer's Disease* 76(4):1215-1242. PMID: PMC7454042 \*Co-first author
3. Vallianatos CN, Raines B, Porter RS, Bonefas KM, Wu MC, Garay PM, Collette KM, **Seo YA**, Dou Y, Keegan CE, Tronson NC, Iwase S. (2020) Mutually suppressive roles of KMT2A and KDM5C in behaviour, neuronal structure, and histone H3K4 methylation. *Communications Biology* 3(1):278. PMID: PMC7264178
4. Yarosz EL, Ye C, Kumar A, Black C, Choi EK, **Seo YA**†, Chang CH† (2020) Cutting Edge: Activation-Induced Iron Flux Controls CD4 T Cell Proliferation by Promoting Proper IL-2R Signaling and Mitochondrial Function. *Journal of Immunology* 1;204(7):1708-1713. PMID: PMC7329364 †Co-corresponding author
5. Choi EK, Aring L, Das NK, Solanki S, Inohara N, Iwase S, Samuelson LC, Shah YM, **Seo YA**† (2020) Impact of dietary manganese in experimental colitis in mice. *FASEB Journal* 34(2):2929-2943.
6. Choi EK, Nguyen TT, Iwase S, **Seo YA**† (2019) Ferroportin disease mutations influence manganese accumulation and cytotoxicity. *FASEB Journal* 33(2):2228-2240. PMID: PMC6338638
7. Choi EK, Nguyen TT, Gupta N, Iwase S, **Seo YA**† (2018) Functional analysis of *SLC39A8* mutations and their implications for manganese deficiency and mitochondrial disorders. *Scientific Reports* 16;8(1):3163. PMID: PMC5816659
8. Grillo AS, SantaMaria AM, Kafina MD, Cioffi AG, Huston NC, Han M, **Seo YA**, Yien YY, Nardone C, Menon AV, Fan J, Svoboda DC, Anderson JB, Hong JD, Nicolau BG, Subedi K, Gewirth AA, Wessling-Resnick M, Kim J, Paw BH, and Burke MD (2017) Restored iron transport by a small molecule promotes absorption and hemoglobinization in animals. *Science* 356(6338):608-616. PMID: PMC5470741
9. **Seo YA\***, Kumara R, Wetli H, Wessling-Resnick M. (2016) Regulation of divalent metal transporter-1 by serine phosphorylation. *Biochemical Journal* 473(22):4243-4254. PMID: PMC510387

10. Patchen B, Koppe T, Cheng A, **Seo YA**, Wessling-Resnick M, Fraenkel PG. (2016) Dietary supplementation with ipriflavone decreases hepatic iron stores in wild type mice. *Blood Cells, Molecules and Diseases* 60:36-43. PMID: PMC5094460
11. **Seo YA\***†, Elkhader JA, and Wessling-Resnick M. (2016) Manganese and other metals distribution in flatiron mice. *Biometals* 29(1):147-55. PMID: PMC4735247
12. **Seo YA\*** and Wessling-Resnic M. (2015) Ferroportin deficiency impairs manganese metabolism in flatiron mice. *FASEB Journal* 29(7):2726-33. PMID: PMC4478796
13. Hennigar SR, **Seo YA**, Sharma S, Soybel DI, and Kelleher SL. (2015) ZnT2 is a critical mediator of lysosomal-mediated cell death during early mammary gland involution. *Scientific Reports* 5:8033 PMID: PMC4306139
14. **Seo YA\***, Lee S, Hennigar SR, and Kelleher SL. (2014) Prolactin-stimulated ubiquitination of ZnT2 mediates a transient increase in Zn secretion followed by ZnT2 degradation in mammary epithelial cells. *Journal of Biological Chemistry* 289(34):23653-61. PMID: PMC4156067
15. **Seo YA\***, Li Y, Wessling-Resnick M. (2013) Iron depletion increases manganese uptake and potentiates apoptosis through ER stress. *Neurotoxicology* 38C:67-73. PMID: PMC3770814
16. Lasry I\*, **Seo YA\***, Ityel H, Shalva N, Pode-Shakked B, Glaser F, Berman B, Berezovsky I, Goncarenco A, Klar A, Levy J, Anikster Y, Kelleher SL, Assaraf YG. (2012) A dominant negative heterozygous G87R mutation in the zinc transporter, ZnT-2 (*SLC30A2*), results in transient neonatal zinc deficiency. *Journal of Biological Chemistry* 287(35):29348-61. PMID: PMC3436150 \*Co-first authors.
17. Dempsey C, McCormick NH, Croxford TP, **Seo YA**, Grider A, and Kelleher SL. (2011) Marginal maternal zinc deficiency in lactating mice reduces secretory capacity and alters milk composition. *Journal of Nutrition* 142(4):655-60. PMID: PMC3301987
18. **Seo YA\***, Lopez V, Kelleher SL. (2011) A histidine-rich motif mediates mitochondrial localization of ZnT2 to modulate mitochondrial function. *American Journal of Physiology Cell Physiology* 300: C1479-89. PMID: PMC3118624
19. **Seo YA\***, Kelleher SL. (2010) Functional analysis of two single nucleotide polymorphisms in *SLC30A2* (ZnT2): implications for mammary gland function and breast disease in women. *Physiological Genomics* 42A: 219-27. PMID: PMC3008367
20. Qian L, Lopez V, **Seo YA**, Kelleher SL. (2009) Prolactin regulates ZnT2 expression through the JAK2/STAT5 signaling pathway in mammary cells. *American Journal of Physiology Cell Physiology* 297: C369-77. PMID: PMC2724096
21. Kelleher SL, **Seo YA**, Lopez V. (2009) Mammary gland zinc metabolism: regulation and dysregulation. *Genes and Nutrition* 4: 83-94. PMID: PMC2690727

**Complete List of Published Work in MyBibliography:**

<https://www.ncbi.nlm.nih.gov/myncbi/1XugazhBiqk5f/bibliography/public/>

Manuscripts under revision

**Seo YA\***, Choi EK, Aring, L, Paschall M, and Shigeki Iwase. Transcriptome analysis of manganese deficient diet fed mouse brain cerebellum. *Frontiers in Genetics*

## PROFESSIONAL ACTIVITIES & SERVICES

### Grant Review Services

- 2020 BioNexus Kansas City Patton Trust Grant Program Review 2020, Ad Hoc  
2019 NIH Integrative Nutrition and Metabolic Processes Study Section (INMP) study section, Ad Hoc  
2017 NIEHS-funded P30 Core Center at the Wayne State University and Henry Ford Health System, Ad Hoc

### Professional Services

- 2019–2020 Secretary/Treasurer, Vitamins & Minerals Research Interest Section, The American Society for Nutrition  
2017 Organizing committee, 4<sup>th</sup> annual conference of Protein Folding Disease Initiative  
2013–2014 President, New England Bioscience Society, Inc: 501(C)3  
*Organization established in 1984 for Korean scientists in the fields of life sciences and biotechnology in New England. Currently over 500 registered members are actively involved and over 3,000 scientists and clinicians have participated in NEBS.*  
2014 Chair, the 22nd Annual Conference of the New England Bioscience Society, Harvard Medical School, Boston, MA

### Professional Memberships

- 2013–present Member, The American Society of Biochemistry and Molecular Biology  
2009–present Member, The American Physiological Society  
2008–present Member, The American Society for Nutrition  
2005–present Licensed Dietitian, Ministry of Health and Welfare, South Korea

## ACADEMIC SERVICES

### University, School & Departmental Service

- 2018–present Admissions Committee, University of Michigan Department of Nutritional Sciences  
2016–present Research Council Committee, University of Michigan School of Public Health  
2016–2018 NS DE&I Representative, University of Michigan School of Public Health  
2016–2018 Member, University of Michigan Rackham Faculty Allies

## TEACHING

- 2018–present Nutrition 631: Vitamin and Mineral Metabolism (3 credits), University of Michigan School of Public Health  
2017–present Nutrition 688: Nutrition Seminar (1 credit), University of Michigan School of Public Health  
2017 Nutrition 638: Nutrigenomics (3 credits), University of Michigan School of Public Health  
2014 Nutrition 202: The Science of Human Nutrition, Harvard School of Public Health, Boston, MA  
2012 Nutrition Seminar Series, Harvard School of Public Health, Boston, MA  
2010–2011 Nutrition 446 Mineral Metabolism, Teaching Assistant, Pennsylvania State University, University Park, PA

## STUDENT/TRAINEE/VISITING SCHOLAR SUPERVISION

### Postdoctoral Fellows

- 2017–present Eunkyong Choi, Ph.D. Dean's Organogenesis Non-traditional Postdoctoral Fellowship (2019–2020)

### Primary Doctoral Dissertation Advisor/Committee Chair

- 2019–present Luisa Aring, Visiting PhD student, Biochemistry, UM SPH and University of Ruhr University at Germane  
2020–present Junru Pan, PhD student, Nutritional Sciences, UM SPH

Dissertation Committee Member

- 2016–2019 Minjung Kho, Epidemiology, UM SPH. *Sodium and potassium intake in multiethnic populations: Associations with genes and blood pressure.*

Primary Master Thesis Advisor/Committee Chair

- 2017–2019 Anqi Jian, Nutritional Sciences, UM SPH. *Association between Third Trimester Urinary Selenium and Manganese and Attention Performance in Mexican Adolescents.*  
2018–2020 Brittany McKenzie, Nutritional Sciences, UM SPH. *Effect of dietary manganese on SLC30A and SLC39A metal-ion transporters in the mouse brain.*  
2019–present Yujie Peng, Nutritional Sciences, UM SPH. *Transcriptomic analysis of cerebellum in the Slc39a8 neuron-specific knockout mouse.*  
2019–present Molly Paschall, Nutritional Sciences, UM SPH. *Genetic variation of SLC39A8 in metabolic diseases.*

Master Thesis Committee Member

- 2017–2019 Quiren Wang, Nutritional Sciences, UM SPH. *The Impact of high fat diet on GLUT1-mediated glucose transport and nitric oxide synthesis in alveolar macrophages cell line*

Undergraduate Research Mentor

- 2019–present Catherine JW Hong, UM Biology  
2018–present Robert Daniels, UM PreMed Student  
2018–2019 Rachna Sridhar, UM Honors College  
2018–2019 Akshay Bhaktawara, UM PreMed Student

Primary Master of Public Health (MPH) and Master's Academic Advisor

Feriha Bilgen (MPH), Anqi Jian (MS), Quiren Wang (MS), Bassil Muriel (MPH), Nassif Afaaf (MPH), Negrete Christina (MPH), McKenzie Brittany (MS), Yujie Peng (MS), Molly Paschall (MS)

**SEMINARS & INVITED PRESENTATIONS**

- 2020 University of Michigan Medical School, Department of Internal Medicine, Mucosal Immunology Research Group, Ann Arbor, MI  
2019 American Society for Nutrition, Nutrition 2019, Baltimore, MD  
2019 10th International NBIA Disorders Association, North Charleston, SC  
2019 Basic & Translational Gastrointestinal Research Conference, University of Michigan Medical School, Ann Arbor, MI  
2018 FASEB Science Research Conference on Trace Elements in Biology and Medicine, Tahoe City, CA  
2018 University of Michigan Medical School, Department of Immunology and Microbiology, Ann Arbor, MI  
2017 University of Michigan Medical School, Department of Neurology, Ann Arbor, MI  
2016 Protein Folding Disease Initiative, University of Michigan Medical School, Ann Arbor, MI  
2016 University of Michigan School of Public Health, Nutrition Seminar, Ann Arbor, MI



- 2016 Environmental Research Seminar, Michigan Center on Lifestage Environmental Exposures and Disease (M-LEEd), University of Michigan School of Public Health, Ann Arbor, MI
- 2016 American Society for Nutrition, Experimental Biology, San Diego, CA
- 2015 University of Michigan School of Public Health, Department of Nutritional Sciences, Ann Arbor, MI
- 2015 University of North Carolina at Chapel Hill, Gillings School of Global Public Health, Department of Environmental Sciences and Engineering, Chapel Hill, NC
- 2015 Harvard T.H. Chan School of Public Health, Department of Genetics & Complex Diseases, Research In Progress Seminar, Boston, MA
- 2015 American Physiological Society, Experimental Biology, Boston, MA
- 2014 Harvard NIEHS Center Fall Retreat, Boston, MA
- 2014 15th International symposium on Trace Elements in Man & Animals (TEMA15), Orlando, FL
- 2014 Korea University, Seoul, South Korea
- 2014 Sungkyunkwan University, Suwon, South Korea
- 2014 Ewha Womans University, Seoul, South Korea
- 2014 Kyunghee University, Seoul, South Korea
- 2014 American Society of Biochemistry and Molecular Biology, Experimental Biology, San Diego, CA
- 2013 Harvard NIEHS Center Metals Core Research day, Harvard T.H. Chan School of Public Health, Boston, MA
- 2013 Gordon Conference, The Cell Biology of Metals, New port, RI
- 2013 American Society for Nutrition, Experimental Biology, Boston, MA
- 2013 Harvard T.H. Chan School of Public Health, Harvard NIEHS Center Fall Retreat, Boston, MA
- 2013 Harvard T.H. Chan School of Public Health, Harvard NIEHS Center Metals Core Seminar, Boston, MA
- 2012 Harvard T.H. Chan School of Public Health, Nutrition Seminar, Boston, MA
- 2012 Pennsylvania State University, Department of Nutritional Sciences, Nutrition Seminar, University Park, PA
- 2012 International Society for Zinc Biology meeting, Melbourne, Australia
- 2012 American Physiological Society, Experimental Biology, San Diego, CA
- 2011 American Society for Nutrition, Experimental Biology, Washington DC
- 2010 International Society for Zinc Biology, Fujihara Seminar on Zinc Signaling and Cellular Functions, Osaka, Japan
- 2010 American Society for Nutrition, Experimental Biology, Anaheim, CA
- 2009 American Society for Nutrition, Experimental Biology, New Orleans, LA